February 10, 1951.

Professor C. A. Stuart,
Biological Laboratory,
Brown University,
Providence, R. I.

Dear Doctor Stuart:

For the past several months, I have been spending some time in trying to find new isolates of Escherichia coli which appear to show genetic recombination according to the methods and interpretations developed by Tatum and myself (e.g., J. Bact. 53, 673, '47; and 59, 211, '50). For a long time it appeared as if our original K-12 strain was unique in possessing this faculty. However, we have recently developed a greatly simplified method for detecting recombination which has permitted the screening of large numbers of cultures. With its help, we find that 5-10% of cultures from human urine can exhibit genetic exchanges with the original K-12 strain.

I am writing to you now to ask whether you would be willing to help us extend the scope of these experiments. Over a period of six months, the Wisconsin Public Health Laboratory has provided about 150 cultures for our tests, which represents a rate very much less than we are capable of absorbing with the simplified screening procedure. From the papers published by your group on the relationships of the coliform and related bacteria, it would appear likely that you have amassed one of the most extensive collections of coliform isolates in this country, and it would be of great help to our progress if this collection could be made available for our experiments. I think it likely, on the other hand, that our results might help to throw some additional light on the systematics and the differentiation of this group of bacteria.

The ten or so cultures we have already detected as capable of recombination show no common characteristics so far that would provide a clue for further tests. One of them is a lactose-nonfermenter; all but three fail to ferment sucrose; none ferment cellobiose. Serological studies are underway. It is highly questionable, however, whether our cultures have been selected from a sufficiently well-studied and diverse population that any correlations between the positive-testers could be very meaningful. We should like to be

able to screen as wide a variety of cultural and serological types as possible, to obtain the most satisfactory material for further genetic exploration of natural differences; on the other hand we also should test a large unselected sample to determine whether there are any features essentially common to the inter-recombinable strains.

I wish I had the judgment to place a limit on the size of the group of strains for which I am asking. Our procedure is not the limiting factor. What I am asking, in essence, is the opportunity to take further advantage of the large amount of work you have already done in collecting and classifying these cultures. I am fully appreciative of the inconvenience and work involved in preparing any group of more than a few cultures for shipment. We expect to repurify and verify the characteristics of any cultures received, so that direct transfers from stock cultures would be quite satisfactory. Finally, I would be very happy to stand the expenses which might be involved in shipping any appreciable number of cultures (glassware, medium, packing, cartage, assistance, etc).

May I also make a specific request of a somewhat different character? Some of my colleagues are interested in the biochemical pathway of sucrose and cellobiose fermentation, and we should like to approach the problem from the viewpoint of biochemical genetics (comparable to Neurospora work). Unfortunately, I have not yet turned up a suitable E. coli culture for this work. We should like to have a strain which actively ferments cellobiose and sucrose, but which does not have the gumminess characteristic of Aerobacter. If you have uncovered cultures which should have the appearance on EMB-cellobiose that typical E. coli has on EMB-lactose, I should be very pleased to hear of them.

If I have omitted any details which you should like to have before deciding which (if any!) cultures from your collection you would care to send, please let me know. I need hardly say how much your help in this matter would be appreciated.

Yours sincerely,

Joshua Lederberg,
Associate Professor of Genetics.